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Group Support Systems (GSS)

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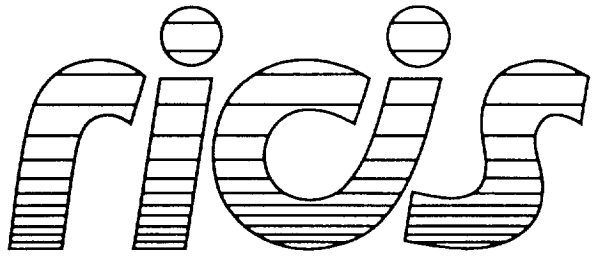

Research Institute for Computing and Information Systems
University of Houston-Clear Lake

The RICIS Concept

The University of Houston-Clear Lake established the Research Institute for Computing and Information Systems (RICIS) in 1986 to encourage the NASA Johnson Space Center (JSC) and local industry to actively support research in the computing and information sciences. As part of this endeavor, UHCL proposed a partnership with JSC to jointly define and manage an integrated program of research in advanced data processing technology needed for JSC's main missions, including administrative, engineering and science responsibilities. JSC agreed and entered into a continuing cooperative agreement with UHCL beginning in May 1986, to jointly plan and execute such research through RICIS. Additionally, under Cooperative Agreement NCC 9-16, computing and educational facilities are shared by the two institutions to conduct the research.

The UHCL/RICIS mission is to conduct, coordinate, and disseminate research and professional level education in computing and information systems to serve the needs of the government, industry, community and academia. RICIS combines resources of UHCL and its gateway affiliates to research and develop materials, prototypes and publications on topics of mutual interest to its sponsors and researchers. Within UHCL, the mission is being implemented through interdisciplinary involvement of faculty and students from each of the four schools: Business and Public Administration, Education, Human Sciences and Humanities, and Natural and Applied Sciences. RICIS also collaborates with industry in a companion program. This program is focused on serving the research and advanced development needs of industry.

Moreover, UHCL established relationships with other universities and research organizations, having common research interests, to provide additional sources of expertise to conduct needed research. For example, UHCL has entered into a special partnership with Texas A&M University to help oversee RICIS research and education programs, while other research organizations are involved via the "gateway" concept.

A major role of RICIS then is to find the best match of sponsors, researchers and research objectives to advance knowledge in the computing and information sciences. RICIS, working jointly with its sponsors, advises on research needs, recommends principals for conducting the research, provides technical and administrative support to coordinate the research and integrates technical results into the goals of UHCL, NASA/JSC and industry.

RICIS Preface

This research was conducted under auspices of the Research Institute for Computing and Information Systems by Dr. Charles Hardwick and Gary P. Hamel of the University of Houston-Clear Lake. RICIS Research Assistant Ravin Wijesinghe provided support for this activity. Dr. Charles Hardwick served as the RICIS research coordinator for this activity.

This report covers the period from June 1, 1994 through May 31, 1995. NASA activity IR01.C funding began 1/1/95. Funding was provided by the Human Resources Directorate, NASA/JSC through Cooperative Agreement NCC 9-16 between the NASA Johnson Space Center and the University of Houston-Clear Lake. The NASA research coordinator for this activity was Judy Solecki, Employee Development Specialist, Human Resources Development Branch, NASA/JSC.

The views and conclusions contained in this report are those of the authors and should not be interpreted as representative of the official policies, either express or implied, of UHCL, RICIS, NASA or the United States Government.

Report Structure

This report includes several levels of information. The first section provides a narrative describing the introduction of groupware technology into the Johnson Space Center through a RICIS research activity; this section represents the bulk of the report and is supported by Appendix I, a transcript of Focus Group sessions held at the National Aeronautical Space Administration/Johnson Space Center.

Appendix II is a supporting set of information reporting data describing the use of the Group Support meeting room at the University of Houston-Clear Lake. This section stands alone but is included to provide a sense of the types of meetings held and some of the feedback from participants.

The last section, Appendix III, lists the computer hardware that makes up the portable computer networked system.

Introduction

Groupware is a term describing an emerging computer software technology enhancing the ability of people to work together as a group. Our experience in using groupware software pointed out the importance of providing facilitation skills training in tandem with the software. Such skills, critical in a meeting room environment, are perhaps more important in settings where meeting participants are distributed over time and participating from various locations. Hence, providing facilitation training and gaining better understanding of how the location of a groupware meeting affected the participants and the meeting's expected outcome emerged as key areas of interest for this phase of this project.

Project Background

In early 1992, a group of people at NASA/JSC were interested in exploring groupware, an emerging computer software. In June, a research activity was established with RICIS to study how this software could improve productivity and stimulate team building. A requirements team, later called the Project Management Team (PMT) was established to survey the field and make recommendations. The PMT drafted the requirements for a decision support and groupware facility housed at the University of Houston-Clear Lake to test and prototype groupware tools and architectures. Activities from fall 1992 through spring 1994 shifted from the task of establishing a facility to the actual operation of that facility.[1]

GSSRL Operations

The Group Support Systems Research Lab (GSSRL) was installed in an existing laboratory in the University of Houston Clear -Lake. The configuration was workable, but static: meeting participants had to travel to the room and attend their "same time, same place" session. More flexibility was desired and a portable computer system, one capable of operation at almost any location, was researched. Increased computer network technology also fueled continued curiosity about distributed "different time, different place" meeting opportunities.

One consistent observation during the sessions was that facilitation training plays an important role in the successful implementation of group support systems technology. Thus providing facilitation skills training and implementing portability emerged as key parts of the next phase of this activity. This paper reports on that phase of the research and covers the period of 6/1/94 through 5/31/95.

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[1] Full details about the research were contained in the RICIS report Group Decision Support Requirements Review, (Gary Hamel, Charles Hardwick, Ravin Wijesinghe, June, 1994).

Training Objectives, Design (flow) and Facilitation

Pilot sessions conducted in the GSSRL revealed that good facilitation is a key to meeting success, whether in an electronic or a non-electronic meeting environment. Not the groupware software, but skilled facilitation had the greatest influence on meeting outcome. Indeed, electronic tools act like amplifiers. With good facilitation and a good electronic meeting system, meetings can be highly effective with a high degree of participant satisfaction. With poor facilitation, electronic tools do little more than intensify dissatisfaction. Moreover, facilitators who work in non-electronic environments (with "sticky notes" and flip charts rather than electronic meeting systems) are not necessarily equally effective when using electronic meeting tools. For example, handling simultaneous input, a characteristic of electronic meeting systems requires different skills than those used in brainstorming with flip charts.

The need, and what seemed a unique opportunity to the project team, was the possibility of sponsoring a program to train facilitators with facilitation skills adapted to electronic meeting systems. The initial needs assessment indicated there was limited understanding of computer supported collaboration. Training a core group of facilitators who also understood group support system tools would be a way of introducing the technology to a wider audience and would also be in line with the objective to introduce group support systems and collaborative technology into the JSC work environment, especially if the facilitators represented a cross section of the Johnson Space Center.

In previous phases of this project, the project team established working relationships with two vendors who were prospective candidates for the proposed training: Interaction Associates and Ventana Corporation. Interaction Associates (IA) is a management consulting and human resource development firm that specializes in the design and implementation of organizational change and renewal processes. Its training services focus on leadership, teamwork and facilitation. Interaction Associates has been in business for approximately twenty years and consults for Fortune 500 companies. All of their training is built around "The Interaction Method." The Interaction Method is based on the notion of shared responsibility as a result of a collaborative attitude, strategic thinking, and facilitative behavior. The company has been highly successful in training facilitators in a rapidly changing business environment. The company did not work in with electronic meeting systems, but was interested in exploring the possibility of adapting their method to electronic meeting systems.

Ventana Corporation's product, GroupSystems V is one of the premier electronic meeting systems. The system offers a suite of electronic tools to help groups gather, organize and analyze information. Their process utilizes both a process facilitator and a technical facilitator. The process facilitator has the responsibility of moving the meeting toward the agreed to meeting objectives, and the technical facilitator has the responsibility of operating the system to provide the participants with the appropriate tools. GroupSystems V is used in the GSSRL.

In earlier stages of this project, Ventana Corporation was very supportive of the research efforts of the project team. The issue of facilitation was also of interest to Ventana Corporation. When approached with the idea of the two workshops and the effort to tailor process facilitation techniques to an electronic meeting environment, Ventana expressed a strong interest in participating.

The Johnson Space Center's Human Resource Directorate (HRD) and Training had used several vendors for facilitation training. A question arose regarding vendor selection for the facilitation training. Two criteria were established as being critical for the training: the vendor would have to be willing to focus the training on electronic meeting environments, and express a willingness to work with Ventana Corporation in follow-up assessments.

Based on these criteria, Interaction Associates was selected over other vendors to provide the facilitation training, and Ventana was selected to provide the electronic meeting system training. In addition, it was decided that two people from Ventana would participate in the Interaction Associates training, and two people from Interaction Associates would participate in the Ventana training.

Organizational Needs Assessment and Focus Groups

Locating appropriate JSC personnel to participate in the training was an important part of this activity. A number of Directorate-specific focus groups were planned and held in order to ensure that the needs for the portable system were understood. Several parameters guided the selection of focus group participants. First, participants were invited from each branch within a Directorate. Second, invited participants had at least three years tenure within JSC-NASA to ensure that they were well acquainted with the work and work processes within the organization. Third, no managers were selected (although there were a few team leads) to ensure we were talking with people intimately involved with doing the work.

The focus group aimed at finding the types of collaborative work accomplished within each Directorate and included items about the kind of work that was accomplished collaboratively, and the pitfalls groups encountered when working together. After a brief description of the system, participants responded to questions about how they might use such a system, how they would feel about using the system, and their perceptions about how others would receive the system.

Each participating Directorate had its own specific potential uses for the system, yet there were still several common themes to all the focus groups. The lack of meeting agendas accounted for a great many problems with meetings. This was at the core of such issues as meeting productivity, clarity of meeting/product ownership, and curbing the pursuit of 'personal' agendas.

When participants were asked about any experience with facilitated meetings, there was a consensus that facilitation had mostly been helpful or could potentially be helpful. Most participants however, felt that facilitators would be the most helpful at non-technical meetings. There was a strong opinion that outside facilitators without content knowledge would be unable to facilitate technical meetings, or would not be accepted in that role.

Most appreciated the possibility of inputting data anonymously, although at least two people registered concerns about this feature. One participant was concerned about the responsibility of inputs in light of anonymity, the other didn't like the idea of not knowing the source of inputs.[2]

It was very difficult to adequately explain the system without a demonstration, which points a potential difficulty later in gaining wide-spread use of the system. It may be necessary for actual hands-on use for most people to understand how they could use the system.

Although there was some valuable information gathered during the sessions that were held (three focus groups were conducted with about 10 participants each), this turned out to be an exercise of lessor value for this project. Such an assessment would be imperative in the case where the corporate culture and work processes are relatively unknown by the implementors of the system, or in the case where focus-groups where used to educate employees about the system more extensively than was possible with this project. The focus group confirmed the efficacy of the choice to include a broad-base of JSC employees as groupware facilitators. There were large scale projects identified in the focus groups specific to each organization and conducive to the use of groupware. The current project benefited by including members of those organizations as groupware facilitators helping to increase the probability of a smooth groupware implementation because of the organizational members greater understanding of those projects.

Presentations With Upper-level Managers

In conjunction with the focus groups, members of the project team conducted presentations of the pilot project with upper-level managers. Presentations were given to upper-level managers in Engineering, Business Management, International Space Station Alpha, Office of the Chief Information Officer, Technology Transfer and Commercialization Office, and MOD Training Directorate. The goal of these

[2] See Appendix I for a review of comments recorded during Focus Group sessions held during this research activity.

meetings was three-fold: 1) to tell management about the pilot project and the capabilities of the portable groupware system; 2) to identify other organizations or managers we should talk with; and 3) to identify potential groupware facilitators within their own organizations.

Identification of Pilot Project Training Participants

Participants for the Interaction Associates and Ventana training classes were identified in three different ways. First, names of possible participants were solicited during meetings with upper level managers. Second, a standard class call letter and explanation of the pilot project was sent to all Directorate training coordinators. And third, a survey of JSC facilitators was used as an opportunity for individuals to identify themselves as potential candidates.

Training

Training Objectives

Several specific training objectives were required from the Interaction Associates class. Thus, during a teleconference with Linda Whitson from Interaction Associates, a number of specific objectives were incorporated into the class design. The basis for the class design was Interaction Associate's Essential Facilitation class and the groupware inspired objectives included: managing conflict, encouraging responsibility in concert with anonymity, managing large amounts of information, and the importance of an agenda planned on multiple levels (products and processes).

Classes held

Mr. David Broadbent from Ventana provided an introduction to the GroupSystems V groupware at the GSSRL electronic facility at UHCL on 4/18/95. Attendees included NASA/JSC employees, a representative from Interaction Associates and RICIS staff.

Interaction Associates

The Interaction Associates workshop training classes were held on 4/19, 20, 21 at the Center for Advanced Space Studies in Houston. The workshop trainers were Laura Moran and Victoria Bains. The "Essential Facilitation" workshop included an introduction to the learning objectives of the workshop; definition and practice with the interactive method of facilitation; advice on planning a meeting; observation of various facilitative behaviors; practice on collaborative problem solving and how to listen and communicate clearly; and advice on how to follow through after a meeting has concluded.

An important part of the training was the ability to partake in practice facilitation sessions. Participants were given the opportunity to practice what they had learned while a videotape recorded the session. The tape was played back for feedback from the Interaction Associate's trainers and a group of their peers.

Generally, the majority of the participants felt the class was very useful in developing facilitation skills. A few people felt this wasn't a skill they needed to work on. A number felt there was too much material to cover in three days. The practice and video-tape feedback sessions were useful for most participants. Answers to scaled questions received high marks. The scales were anchored with 5 at the positive end of the scale and 1 at the negative end of the scale.

Review feedback forms from Interaction Associates workshops:

Question	Mean	STD	High	Low
Overall evaluation of workshop	4.5	.516	5	4
Degree to which objectives were accomplished	4.187	.403	5	4
Instructor demonstrations	4.75	.447	5	4
Energizers	4.437	.629	5	3
Large group discussions	4.25	.577	5	3
Flipcharts	4.687	.478	5	4
Instructor presentations	4.562	.629	5	3
Written materials	4.187	.655	5	3
Pair/Trio exercises	4.187	.91	5	2
Small group practice	4.94	.25	5	4

Ventana Corporation

Ventana Corporation was founded in 1989 by researchers at the University of Arizona to develop and market group productivity products. The DOS version of Group Systems V was released in June, 1992 and a Windows version released in July, 1994. Ventana is headquartered in Tuscon, Arizona and operates a full service facility in Falls Church, Virginia.

The Ventana workshop training classes were held on 5/10, 11, 12 in the GSSRL at UHCL. The trainers were David Broadbent and Gene Quidort. The workshops were broken into "Fundamental Skills" on the first day; "Session Leader Training" on the second day; and a practice facilitation session using a "same-time, same-place" electronic meeting environment on the last day.

An on-line class evaluation was completed by the participants; it included feedback on the trainers, the course itself, and the software. Answers to scaled questions received moderate to moderately high ratings. The scales were anchored with 5 at the positive end of the scale and 1 at the negative end of the scale.

Review feedback forms from Ventana workshops:

Question	Mean	STD	High	Low
Practical application of this course to your needs	3.64	.67	4	2
Organization of the lesson plan	Data missing			
Instructor's knowledge of the subject matter	4.63	.52	5	4
Instructor's ability to communicate	4.00	1.15	5	1
Instructor's attention to individual needs	3.60	1.43	5	1

It was clear from the comments that the first day was slower than most participants wanted. They would have preferred an earlier transition to hands-on practice sessions. When the hands-on work in small groups did start -- participants indicated this was particularly helpful. There was a mixed response regarding the course content. A few of the participants wanted more detail, while others wanted to jump in and use the tools.

Many of the participants mentioned that additional practice would be needed in order to use the system. At least six comments centered around the fact that GSV is programmed in DOS. These people said they would have much preferred if the program had been available in Windows. The current DOS based program was characterized as too complicated.

A few people echoed the systems "selling points" as things they appreciated. These included the shared viewing of results, the ability of the system to capture input in the participants in their own words, and the flexibility of the system. A number of people listed the ways in which they planned to use the system. These applications ranged from use of the survey tool to using the GroupLink tool for distributed meetings.

Observations:

The PMT believed that much beneficial overlap existed between the two workshop companies. Interaction Associates has 20 plus years of traditional facilitation experience; Ventana has one of the most powerful electronic groupware software programs. The potential training benefits to both companies and NASA/JSC seemed great if the competencies of both approaches could be mapped together. Unfortunately, although both members of Ventana participated in the Interaction Associates workshop, the Interaction Associates representative was unable to attend the Ventana workshop.

Lessons learned from the project team - overall assessment evaluation

This project brought together a representative group of NASA/JSC people from assorted organizations within NASA/JSC -- not just people from the HRD training office or from the Information Systems Directorate at NASA/JSC. This has an important potential of assisting the diffusion of the GSS technology throughout JSC. The GSS research activity had, over the past two years, generally been bringing groups randomly to the GSSRL facility at UHCL.

Using people from various organizations appears to be a better approach, in tune with business literature on future organizational development.[3] The two workshops allowed people to learn more about traditional facilitation skills as well as gaining an understanding of GroupSystems V tools and how they can be introduced into the JSC work force. Because workshop participants had facilitation experience in their background, they were better able to identify work applications for a GSS system, applications several saw as directly related to process improvement. Indeed, many people expressed interest in distributed electronic systems -- continuing the training using network technology and groupware. Organization managers, unfamiliar with groupware, have trouble understanding an electronic meeting environment. Beacheading groupware into an organization requires "success stories" within the organization. Real understanding of the collaborative power and process improvement opportunities that GSS offers comes only with continued use. But this has a downside: a lot of training time is required for people to master groupware. Book training is not enough. People who attended the workshops need future practice time to continue the training; they are not "street ready" yet and need facilitation opportunities to continue the training.

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[3] See, e.g., David Kirkpatrick, "Here Comes the Payoff from PC's," Fortune, 3/23/92; Kathleen Melymuka, "Teamwork Tools," CIO Magazine, 11/1/91, pp. 52-53; and Alan R. Dennis, J.F. Nunamaker, Jr., David Paranka and Douglas R. Vogel, "A New Role for Computers in Strategic Management," The Journal of Business Strategy, September/October, 1990, pp. 38-42.

Questions remain about how to implement groupware into an organization. For instance:

> How to best train people to use the portable GSS system?
> What are some general system recommendations and software assessment for JSC use?
> How to continue the "virtual team" assembled?
> What are the training and process issues of having a portable groupware training facility?

Operating a GSS is a labor-intensive assignment; the excitement of new technology and learning opportunities needs balance by administrative and budget guidelines. Procedures on how to properly plan, run, and back up data from GSS sessions are required. Using a portable GSS network adds new concerns. Distributed GSS over networks brings its own set of issues.

The Portable GSS System [4]

One of the project objectives was to make the use of GSS tools as accessible as possible to JSC work groups. To overcome the difficulty caused by tight schedules and off site meetings, funding for a portable GSS was included in the cost of the project. A portable system would allow HRD and the project team to bring the system to various locations at JSC. The portable system is intended to allow participants and meeting facilitators to take advantage of the technology without making the use of the tools a special issue.

The portable system was purchased but unfortunately did not arrive and test out as functional until the end of this phase of this research activity. The portable system was networked into the existing GSSRL facility at UHCL for the Ventana training workshop. Because the portable system is a separate facility, a new GroupSystems research license is required. RICIS will work to obtain that license for research to be conducted at NASA and UHCL. Supported by HRD, one initial use of the portable system would allow participants of the training workshops to practice their facilitation skills. Eventually, under the supervision of HRD, the portable system will be taken to different meeting sites for use by work teams. The system will regularly be stored in Building 45 at NASA/JSC. However, because of the Cooperative Agreement between NASA and UHCL, the system may also be used by researchers at RICIS to study groupware and train students in the use of this emerging technology.

Recommendations

Participants for the two workshops were selected by the Human Resources Development Branch to represent a variety of needs and requirements as described in organizational assessment feedback. This core group constitutes a working team that was asked to participate in follow-on studies in collaborative work processes and technologies. This "virtual team" of JSC personnel, many with extensive facilitator training in their background, provides an excellent opportunity for continued learning about applications and training methods to assist the transferring of groupware technology into JSC organizations.

Conclusion

In summary, this deliverable reported the activity of this project from June 1, 1994 through May 31, 1995. It detailed the design of workshops as modes of instructional modules to advance knowledge in leadership, process and technical facilitation, team building, and collaborative work using group support tools, methods, and processes.

Outcomes from this project and its follow-on activities will allow the Human Resources Development Branch to better design workshops, courses, and seminars focused on the collaborative knowledge and skills needed to address, within JSC, the challenges and demands of a rapidly changing work environment.

The report also proposes recommending continued investigation about how the information that was learned in the first two phases of this project may be used to design, develop, and implement distributed groupware

[4] The system is described in the Appendix.

systems that allow participants to work in same-time/different place and different time/different place environments.

Clearly, groupware software is not simply a "plug and play" technology. The technology requires skilled facilitation to function seamlessly. RICIS is hopeful that ways will be found to sustain this activity to allow the JSC team to continue the training they received in their two workshops; specifically how to better facilitate meetings and how to use groupware as a technology to assist in collaboration and process improvement.

APPENDIX I: Focus Group Data

These comments were transcribed from traditional paper tear sheets collected at Focus Group sessions held at the Johnson Space Center.

The Focus Group questions were:

1- What sort of tasks does your work group accomplish collaboratively/together?

2- What are the most frequent types of meetings within your area? (e.g., status, information meetings)

3- From each of your personal perspectives, what sort of barriers exist to you working collaboratively with others in your team/work group?

3a- What could you suggest to overcome these barriers?

4- When groups have a hard time accomplishing what they set out to do, it's often because there has been a breakdown in group processes. What are some of the things that prevent your group from accomplishing what you set out to do?

4a- Do you have any suggestions about what could prevent these process breakdowns?

5- How do you feel about an outside facilitator coming into your work team/work group for specific meetings? Has this ever been helpful to you in the past?

6- Based upon your knowledge, what electronic communication tools are being used to support people working together/ working together on teams?

6a- What is good/bad about any of these?

7- Do any of you have experience with electronic communication tools or electronic meeting systems? (list examples for them). What was that experience?

8- If it would better help you accomplish your work, how open do you think you would be to adopting electronic meeting systems/ electronic communication tools? How about the people you work with? How about your boss?

9 - How could your group use this? For what kinds of activities?

A. *Tear sheets from 3/21/95 Business Management Focus group*

1- What sort of tasks does your work group accomplish collaboratively/together?

Budget Planning
Pop Cycles, develop requirements & how fit into budget

Contractual analysis
-Spreadsheets
-PEC / PEB reports
-award fee evaluation

Source Board
-analyze diff. proposals - who most capable at best $
-pulls in budgeting, tech. folks
procurement

-integration of orgs.

Close-out (contract)
-follow-up to see if met requirement-integration of lots

Termination of contract means a lot more integration
IG, GAO, legal, etc.
more litigation here

Team actions
workforce requirement
cross-cutting reviews
streamlining

Reconstruct contracts / consolidation of contracts
ex: Completion form to level of effort
negotiations through chain of command approval process
Bringing groups together
meeting multiple needs

2- What are the most frequent types of meetings within your area? (e.g., status, information meetings)

a) Staff Meetings (Weekly)
-Actions Assigned

b) Briefings
-info
-position
-pitching info
-providing info

c) Status
-metrics and WHAT to measure?
-assessment vs. tracking value
-manage outcomes

3- From each of your personal perspectives, what sort of barriers exist to you working collaboratively with others in your team/work group?
3a- What could you suggest to overcome these barriers?

a) Lack of Communication
-contacts - WHO to contact
-lack of information
-point of contact missing
- paper trail vague
- non-compatible systems: e-mail - book systems don't allow even accounting & contracts work together
-this applies to ALL of NASA, to HQ - would make Pops easier

b) Timing
-ability to schedule
-phone tag
-interaction difficult: contacts / phone call
-barriers = PHYSICAL - people in different locations, not same bldg. diff. rooms, phone numbers wrong in JSC phone book

4- When groups have a hard time accomplishing what they set out to do, it's often because there has been a breakdown in group processes. What are some of the things that prevent your group from accomplishing what you set out to do?

4a- Do you have any suggestions about what could prevent these process breakdowns?

Value of some meetings poor - why hold it?
-Who determines who attends?
-Self-empowerment - Do you feel like you should attend? OK Go. If not, stay at your work area.

5- How do you feel about an outside facilitator coming into your work team/work group for specific meetings? Has this ever been helpful to you in the past?

Depends on type of mtg.
-unrelated to day to day - OK
(Do not use a contractor.)
needs to be at a high level
-"sensitive" mtgs. = no, keep it in family
-JSC Employee OK to bring in

Structure provider
-would JSC facilitator work at High Level meeting? Leaders need to run the mtg.
-working level - easier to keep on track
-higher level - more political

Re: People form diff. orgs. - a facil. helps keep on track. May not work on a day to day basis.

TQM type facilitator - still need to keep dynamics of personnel in mind.

6- Based upon your knowledge, what electronic communication tools are being used to support people working together/ working together on teams?

paper
fax
disc
MS mail
Profs
C.C. mail
Phone mail
Ipms -integrated procurement mgmt systems
-don't really use - don't have access

6a- What is good/bad about any of these?

Transmitting document - can't send

7- Do any of you have experience with electronic communication tools or electronic meeting systems? (list examples for them). What was that experience?

Erroneous data - inconsistencies between systems.
-frustrating solving these errors
-time to track down

Transmitting to contractor - give up & use hard copy
(even information systems contract)

8- If it would better help you accomplish your work, how open do you think you would be to adopting electronic meeting systems/ electronic communication tools? How about the people you work with? How about your boss?

Open at working level
Persons entrenched in own methods
-too many fails, need proof esp. at higher level
-feel workable
-if more productive - why wouldn't be open to it?

9 - How could your group use this? For what kinds of activities?

Source board - Good because structured
-Everything on Q1
-Award fee process

B: *Tear sheets from 3/23/95 Focus Group: JSC Engineering*

1- What sort of tasks does your work group accomplish collaboratively/together?

1. What sorts of tasks
    *Technical tasks, e.g., how to design a mission to Mars - everyone adding a piece
    *Status what's occurring
        -how far proceeding with schedule
        -particular problems
    *Information - give schedules, Top 10 list
    *Technical - what broke, how to fix, problem-solving
    *Tech and Status combo - what I've accomplished - how to best work with interfaces, integration

2- What are the most frequent types of meetings within your area? (e.g., status, information meetings)

2. Presentations / Briefing
    SSA - some info / maybe not
    staff meetings
    status every morn. - updates

3- From each of your personal perspectives, what sort of barriers exist to you working collaboratively with others in your team/work group?

3. Availability for meetings
    finding room - size (forget c/s)
    incompatibility between MS - mail centers & contractors
    MS mail consistency problems / server time critical issues - can't depend
    Fax machine - wait in line or not working
    Lack of org. - people don't know why there - no agenda
    No control
    Attempts at control ignored
    Co location - can't follow up on issues
    Off-site mail - delivery problems
    ---> send mail to house

3a- What could you suggest to overcome these barriers?

3a. Fax modem - just need some access
    Computer access to receiving
    Computer scheduling of rooms / meetings (not currently used)
    ind Computer scheduling not used - Don't have dedicated people
    Meetings: need agenda, purpose, end time
        pre-planning people who call meeting
    Standard meeting -- not enough planning - no coordination
    Meeting 'runner' and agenda planner
    Cut down on number of meetings
    Take advantage of technology already here

    Good
    Don't make a difference
    Tech meetings no - need to be able to make decision
    Should be inside person
    Managers take facilitators class
        anyone could benefit
    Problems Elec. Comm.
        Always in diff. place - can't find someone to talk to them

7- Do any of you have experience with electronic communication tools or electronic meeting systems? (list examples for them). What was that experience?

7. -May not make sense for status meeting
-Good for "how to" type of meeting - keep ideas from being shot down
-Depends on makeup of group eg. where strong hierarchy would be good
-+ coordinate ideas
-+ already using similar technology e.g. overheard projector shows notes
-usu. very specific problem
-+ most would welcome this; very power-oriented people wouldn't like it
-can even playing field

Electronic Comm.

Fax
MS Mail
File Transfer (FTP)
Appleshare
Internet (tend to wander off)
Phone mail
Beepers
Telephones

Problems:

Hardware dependency - Cross-platform compatibility
Phone tag

c: *Tear sheets from 4/17/95 Focus Group:* Center Operations (JA)

1- What sort of tasks does your work group accomplish collaboratively/together?
1. Design and Construction of Facilities
-diff. disciplines of eng. teams w/ budget, planning
each responsible for own area
slackers hurt everyone
-don't work w/ teams
shipping - comes through her
find info.
work w/ contractors
procurement task
property audit
analyze systems

Gather information
use procedures / govt. relations
then form analysis

Foreign national and badging team
-developing mgmt directives
-developing forms
-requirements
-evaluating who in data base?
w/ legal and procurement
on contract clause - use email

2- What are the most frequent types of meetings within your area? (e.g., status, information meetings)
2. Personality Conflicts
Sending out for review -
need reminders
On same level - diff. priorities no leverage
Teams don't evaluate each other
-Interpretation of regs.
agree to something that covers relevant working area or someone declares
-Keeping Focus
bringing their own problems

3- From each of your personal perspectives, what sort of barriers exist to you working collaboratively with others in your team/work group?
3. Agenda - Stick to it
Work w/ other areas
they need to keep their schedules
Having monthly priority meetings but no recourse if not done
Need someone with clout to solve problems
Clout - mgmt. problem - mgrs. priorities relevant
Mgrs. - haven't empowered employees such that their work is priority
Solved jealousy problem by agreeing to group award
4. No data.
5- How do you feel about an outside facilitator coming into your work team/work group for specific meetings? Has this ever been helpful to you in the past?
5. Might be helpful
not experience with
Content experience needed.

6- Based upon your knowledge, what electronic communication tools are being used to support people working together/ working together on teams?

6. E-mail
    Microsoft mail
    reviewing documents

Status
  Mtg. reminder
  informational data base

FW documents became unwieldy - wrong info.
Systems not compatible
Documents-which is more current
    when modify

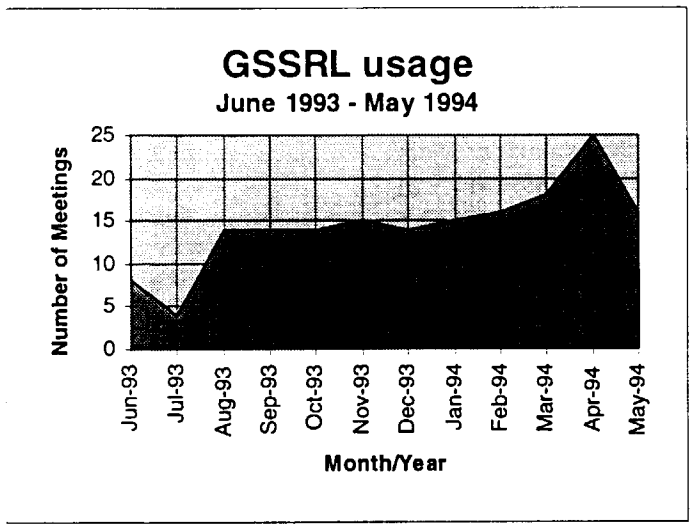
Some don't want to use new system
    -one to one attention helpful
    user friendly
Useful for selection Board
    architect
    design reviews
    do it with word now
    -could use review comments and add comments
Form revision
    seeing others' comments helpful
Think would want to know who said what

Revising Branch operating procedures
    -Collecting revisions
    other directives

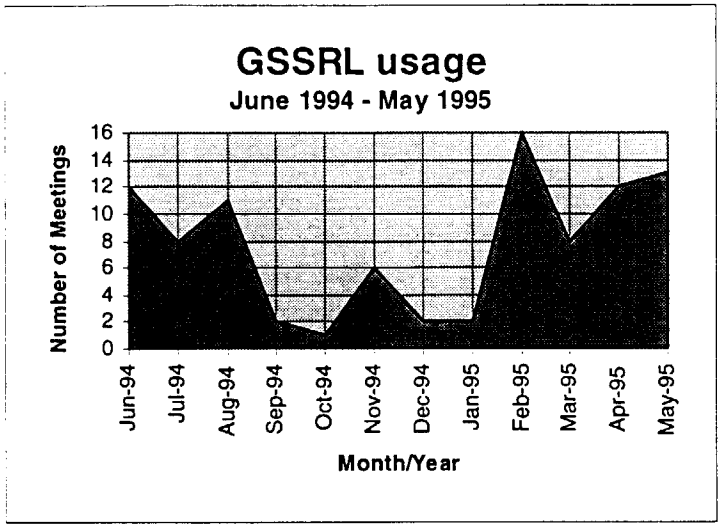
Mgmt. OK with it
Attend meetings with people from other orgs.
Interface w/ Russian
Use instead of fax

APPENDIX II: Overview of GSS Sessions Held at the University of Houston-Clear Lake

Lab Usage *In comparison with data recorded for the 1993-94 period, lab use reduced from 173 meetings to 93 meetings. The period 1993-94 consisted of more pre-meeting, demonstration, and research type of short time duration meetings. Even though the total usage was down, 1994-95 activity consisted of many long duration meetings, (some lasting as much as 5 days per session). In short, there were fewer meetings, but meetings held were of longer duration.*

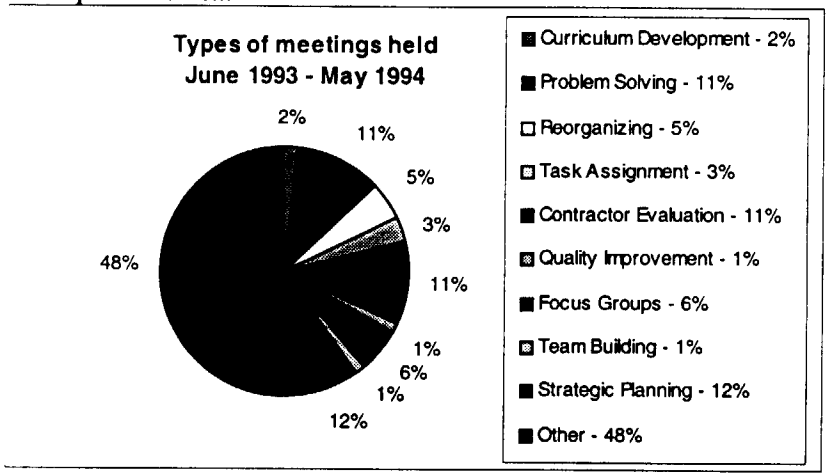


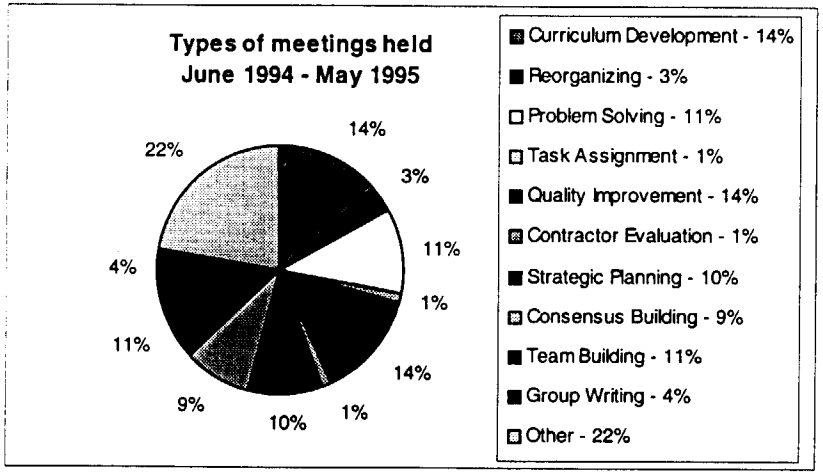
Month/Year	# meetings
Jun-93	8
Jul-93	4
Aug-93	14
Sep-93	14
Oct-93	14
Nov-93	15
Dec-93	14
Jan-94	15
Feb-94	16
Mar-94	18
Apr-94	25
May-94	16
Number of Sessions =	173



Month/Year	# meetings
Jun-94	12
Jul-94	8
Aug-94	11
Sep-94	2
Oct-94	1
Nov-94	6
Dec-94	2
Jan-95	2
Feb-95	16
Mar-95	8
Apr-95	12
May-95	13
Number of Sessions =	93

The types of meetings held ***The types of meetings held also reflected the change in emphasis. More effort was placed on getting groups to work together, as opposed to providing a demonstration of the tools. Thus, Group Writing, and Consensus Building type meetings appeared during this time period, as did attention to quality improvement. Getting the technology more acknowledged within UHCL resulted in increased use of the tools for curriculum development as well.***

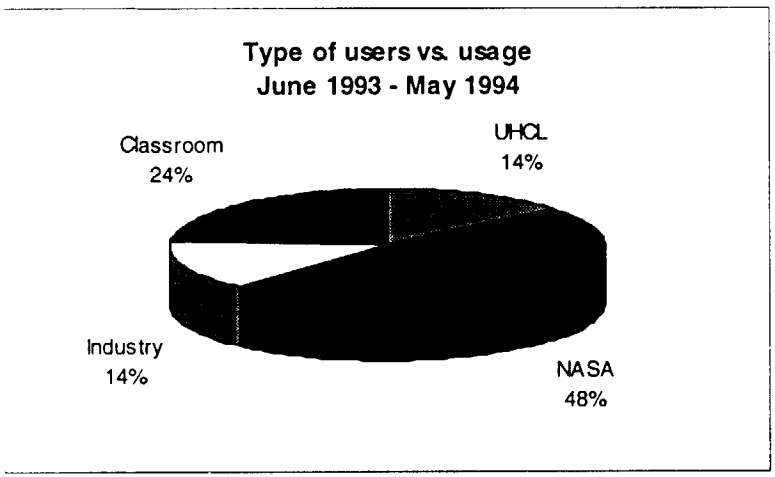


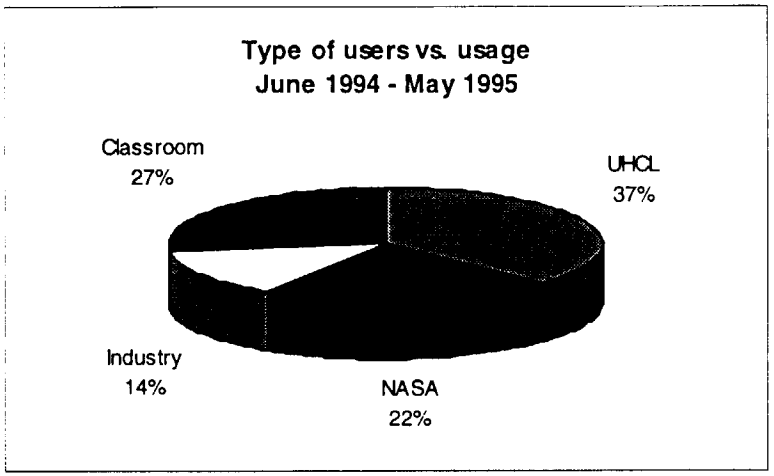


The types of meetings conducted for the period 1994-95 were identified as :

1. Strategic planning
2. Problem Solving
3. Re-organizing
4. Task Assignment
5. Team Building
6. Contractor Evaluation
7. Quality Improvement
8. Curriculum Development
9. Group Writing
10. Consensus Building
11. Other (pre-meeting, inconclusive decisions, etc.)

Types of Users vs. Lab Usage ***Participants using the GSSRL shifted from predominantly NASA-based to mainly UHCL-based. The use of the lab by Professors for teaching and exposing Groupware technology to their students also increased by 3% in comparison with 1993-94 usage of 24%. Use of the lab by Industry/External Groups remained at 14% However, the 14% of meetings conducted for Industry/External groups required a considerable time period for pre-meeting, and majority of these meetings were conducted over a several day time period.***

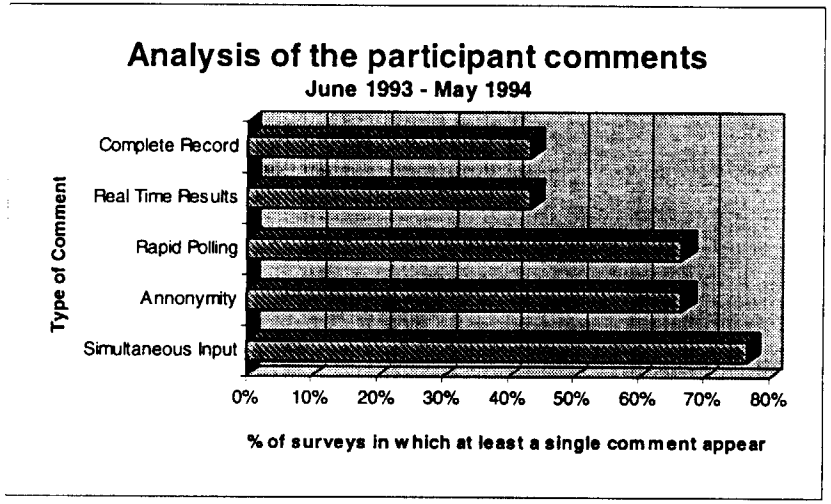




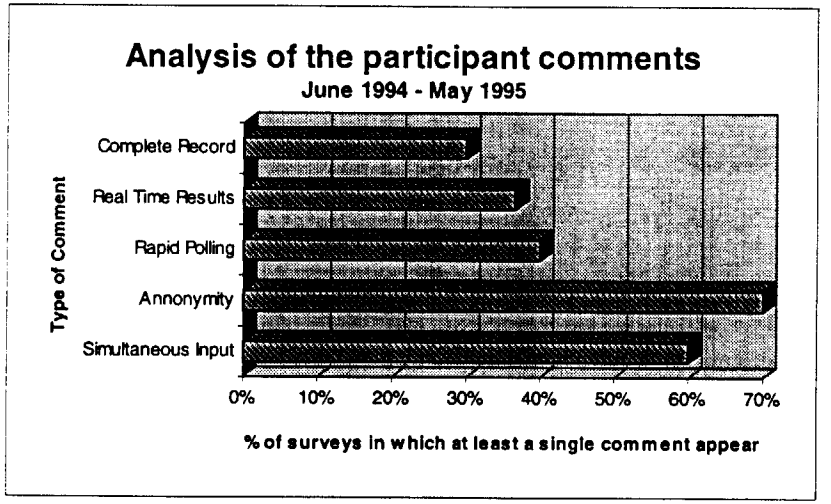
User Group	# meetings
Classroom	42
UHCL	24
NASA	83
Industry/External Group	24

User Group	# meetings
Classroom	25
UHCL	35
NASA	20
Industry/External Group	13

Analysis of Participant Comments *The participants comments were analyzed into: simultaneous input; anonymity; rapid polling; real time results; and complete record. Anonymity emerged as more important than simultaneous input. Perhaps this was because of the shifting nature of the sessions held. People considering problems or working together to create a curriculum or improve quality may consider anonymity as a major advantage to getting ideas "on the table" for discussion. Real time results and complete record were considered less important than the previous year. Repeat users may take these features for granted and not comment.*

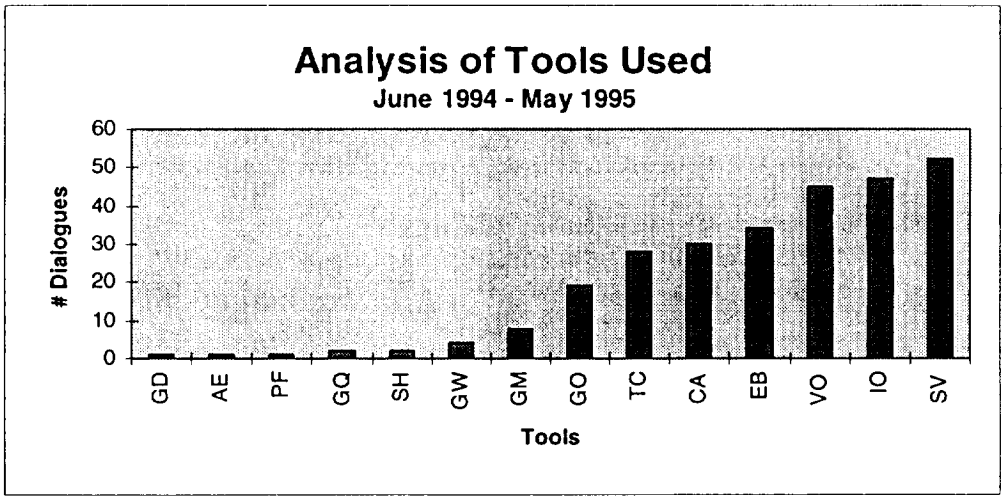


	%
Simultaneous Input	76.67%
Anonymity	66.67%
Rapid Polling	66.67%
Real Time Results	43.33%
Complete Record	43.33%



	# of Surveys Contained in	%
Simultaneous Input	18	60.00%
Anonymity	21	70.00%
Rapid Polling	12	40.00%
Real Time Results	11	36.67%
Complete Record	9	30.00%

Analysis of the Tools *Use of the tools for various meetings matched the team building emphasis reported in the previous graphs. Thus a considerable amount of meetings consisted of agendas which would generate/gather ideas (Brain storm, Categorize, Idea Organize, etc.), allow participants to make decisions based on the ideas gathered (Vote, Survey, etc.), and to gather additional information on the selected ideas (Topic Commenter, Idea Organizer, etc.) The survey tool was the most widely used tool because each meeting concludes with a survey of the session process, of the tools used and meeting improvement.*



Tool	# Dialogues
Group Dictionary (GD)	1
Alternative Evaluation (AE)	1
Policy Formation (PF)	1
Questionnaire (GQ)	2
Stakeholder Identification (SH)	2
Group Writer (GW)	4
Group Matrix (GM)	8
Group Outliner (GO)	19
Topic Commenter (TC)	28
Categorizer (CA)	30
Electronic Brainstorming (EB)	34
Vote (VO)	45
Idea Organization (IO)	47
Survey (SV)	52

Appendix III: The Portable Group Support Systems Computer System

One Canon BJ200EX Printer with cable

One 550LS Active Matrix Color VGA Projection Panel

One Dukane High Intensity Overhead Projection Unit

One MPC Model 899 Multimedia Notebook 486 Server with carrying case
(Configuration: Intel 486 DX4/100MHz CPU, 20MB RAM, 810MB Hard Disk, Dual-Scan Passive Matrix Color Display, Double Speed CD-ROM Drive, External 3.5" 1.44MB Floppy Drive, TrackPoint Mouse, Xircom PCMCIA Ethernet Adapter w/ cable, Novell 3.12

Ten MPC Model 799 Notebook 486 computers with carrying case
8MB RAM, 310MB Dual-Scan Passive Color Display, Built-in 3.5" 1.44MB Floppy Drive, Glide-Point Mouse, D-Link PCMCIA Ethernet Adapter w/ cable